

REMARKS

Claims 1-24 are pending and are rejected. Claims 2-4, 6-20, and 22-24 have been amended. No new matter has been added. Applicant respectfully requests reconsideration of this application.

Drawing Objections

The Examiner objected to the drawings because “all blocks in figures 1-3 should be labeled with descriptive legends” (Office Action, page 2, lines 1-2). Applicant disagrees. 37 C.F.R. §1.74 states: “When there are drawings, there shall be a brief description of the several views of the drawings and the detailed description of the invention shall refer to the different views by specifying the numbers of the figures and to the different parts by use of reference letters or numerals (preferably the latter).” Because each element in figures 1-3 is labeled with a reference numeral, as prescribed by 37 C.F.R. §1.74, and the specification refers to each reference numeral, the drawings are in compliance with the requirements of 37 C.F.R. §1.74.

Claim Objections

Claims 2-4, 5-12, 14-20, and 22-24 were objected to for using the term “invention” in the preamble of each respective claim. Applicant has amended these claims accordingly.

Claim Rejections -- 35 U.S.C. § 112, second paragraph

Claim 13 stands rejected under 35 U.S.C. § 112, second paragraph as being indefinite. Applicant has amended Claim 13 accordingly.

Claim Rejections -- 35 U.S.C. § 102

Claims 1-4 and 21 stand rejected under 35 U.S.C. § 102(b) as being anticipated by "Packet Classification on Multiple Fields," Pankaj Gupta and Nick McKeown, Proc. Sigcomm, Computer Communication Review, vol. 29, no. 4, pp. 147-60, September 1999, Stanford University (“Gupta”). Applicant respectfully submits that Claims 1-4 and 21 are not anticipated by Gupta.

Claim 1 recites, in part:

- (d) determining which sub-databases to search, said determining further comprising comparing at least some of the packet header to the plurality of Necessary Path Condition Rules

Gupta discloses a flow classifier that classifies which flow a packet belongs to and

determines whether and where to forward the packet (Gupta, Introduction, lines 8-12). More specifically, Gupta describes a sequence of parallel look-up functions in which “F fields of the packet header are split into multiple chunks that are used to index into multiple memories in parallel.” Then, in subsequent phases, “the index into each memory is formed by combining the results of the lookups from earlier phases” (Gupta §5.2). Thus, Gupta teaches using packet bits to simultaneously search all “phase 0” memories, as depicted in Gupta’s figure 5; Gupta does NOT disclose or suggest “determining which sub-databases to search” as recited in Claim 1.

The Office Action seems to equate Gupta’s flow classifier with “determining which sub-database to search” as recited in Claim 1.

However, as discussed above, Gupta’s flow classifier “determine[s]...which flow an arriving packet belongs to so as to determine whether to forward or filter it, where to forward it to, what class of service it should receive, or how much should be charged for transporting it” (Gupta, Introduction, lines 4-8). Thus, a flow classifier is not the same as “determining which sub-database to search,” as recited in Claim 1.

Therefore, because the Office Action has failed to point to any language of Gupta that discloses or suggests “determining which sub-databases to search by comparing at least some of the packet header to the plurality of Necessary Path Condition Rules” as recited in Claim 1, Gupta does not anticipate Claim 1.

Claims 2-4 depend from Claim 1 and therefore distinguish over the cited reference for at least the same reasons as Claim 1.

Claim 21 recites, in part:

means for determining which sub-databases to search given a packet

As discussed above, Gupta fails to disclose or suggest “determining which sub-databases to search, said determining further comprising comparing at least some of the packet header to the plurality of Necessary Path Condition Rules.” Therefore, Gupta fails to disclose or suggest “means for determining which sub-databases to search given a packet” as recited in Claim 21.

Claims 5-10 are rejected under 35 U.S.C. § 102(b) as being anticipated by "Packet Classification using Hierarchical Intelligent Cuttings," Pankaj Gupta and Nick McKeown, Proc. Hot Interconnects VII, August 99, Stanford University ("Gupta II"). Applicant respectfully submits that Claims 5-10 are not anticipated by Gupta II.

Claim 5 recites, in part:

constructing a hierarchical subdivision tree, comprising a single root, a plurality of nodes, and a plurality of leaves, wherein the root, the nodes, and the leaves are interconnected by a plurality of branches, wherein each branch corresponds to a value of a selected bit of the W bits of at least a subset of the plurality of the N classification rules and wherein a separate branch is constructed for each different value of the selected bit, including the values 0, 1 and X, within the subset of the plurality of the N classification rules

Gupta II fails to disclose that a separate branch is constructed for each different value of one selected bit as recited in Claim 5. Instead, Gupta II discloses a packet classification technique in which the rules of a classifier are recursively "cut" (divided) to build a decision tree in which the leaf nodes correspond to boxes of fewer than a threshold number of rules (Gupta II, Section 4), where a given rule may appear in multiple boxes of rules for a given decision tree. More specifically, Figure 2 of Gupta II shows that application of the "HiCut" algorithm yields a decision tree in which rule R2 appears in boxes 1, 3, 4, and 5 (numbering boxes in Figure 2 from left to right). Because rule R2 appears in multiple nodes of the decision tree, the decision tree in Gupta II is not constructed using a separate branch for each different value of a selected bit. Construction of a tree as recited in Claim 5 would avoid placement of a given rule in more than one node.

Therefore, because Gupta II does not disclose or suggest "constructing a separate branch for each different value of a selected bit" as recited in Claim 5, Gupta II does not anticipate Claim 5.

Claims 6-10 depend from Claim 5 and therefore distinguish over the cited reference for at least the same reasons as Claim 5.

Claim 13 stands rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,374,326 to Kansal (“Kansal”).

Claim 13 recites, in part:

an All Matching Rules Engine to generate, based on a first subset of bits within a search value, selection signals that indicate which of a plurality of sub-databases are to be searched for a match to a second subset of bits within the search value;
a plurality of Best Matching Rules Sub-Engines to store the plurality of sub-databases and to search the sub-databases indicated by the selection signals for at least one match to the second subset of bits within the search value

Kansal fails to disclose or suggest a “selection signals that indicate which of a plurality of sub-databases are to be searched for a match” as recited in Claim 13. Instead, Kansal discloses a multiple bank CAM for which bank keys are generated using an input key (Kansal, col. 5, line 55 – col. 6 line 2). The bank keys are passed to corresponding banks of the CAM and “*each bank* performs a lookup of the supplied bank key as commanded” (Kansal, col. 6, lines 5-7; see also Fig. 4, step 440, “Perform lookup in *all banks* using corresponding keys”). Thus, Kansal teaches that all the CAM blocks are selected for search operations. This is in contrast to Applicant’s Claim 13.

Thus, because Kansal does not disclose or suggest an “All Matching Rules engine to generate...selection signals that indicate which of a plurality of sub-databases are to be searched for a match...[and] a plurality of Best Matching Rules Sub-Engines...to search the sub-databases indicated by the selection signals...” as recited in Claim 13, Kansal does not anticipate Claim 13.

Claim Rejections -- 35 U.S.C. § 103

Claim 24

Claim 24 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Kansal. Applicant respectfully traverses this rejection.

Claim 24 depends from Claim 13 and therefore distinguishes over Kansal for at least the same reasons and Claim 13.

Claims 14-20

Claims 14-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kansal in view of Gupta. Applicant respectfully traverses this rejection.

Claims 14-20 depend from Claim 13 and therefore distinguish over the cited references for at least the same reasons as Claim 13.

Claims 11-12

Claims 11-12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Gupta II in view of Huan Liu “Reducing Routing Table Using Ternary-CAM,” Department of Electrical Engineering, Stanford University, CA 94305 (hereinafter “Liu”). Applicant respectfully traverses this rejection.

Claims 11-12 depend from Claim 5 and therefore distinguish over the cited references for at least the same reasons as Claim 5.

Claims 22-23

Claims 22-23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Gupta in view of Liu. Applicant respectfully traverses this rejection.

Claims 22-23 depend from Claim 21 and therefore distinguish over the cited references for at least the same reasons and Claim 21.

Conclusion

Applicant respectfully submits that all pending claims are in condition for allowance. If a telephone interview would be helpful in any way, the examiner is invited to call the undersigned attorney.

A petition for a one (1) month extension of time is included herewith.

Applicant hereby authorizes deposit account 501914 to be charged for any fees due in connection herewith, including any extension-of-time fee.

Respectfully submitted,

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